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## ABSTRACT OF THE DISCLOSURE

The invention encompasses a method of bonding a first mass to a second mass. A first mass of first material and a second mass of second material are provided and joined in physical contact with one another. The first and second masses are then diffusion bonded to one another simultaneously with the development of grains of the second material in the second mass. The diffusion bonding comprises solid state diffusion between the first mass and the second mass. A predominate portion of the developed grains in the second material have a maximum dimension of less than 100 microns. The invention also encompasses methods of forming a physical vapor deposition target bonded to a backing plate.